CHAPTER 8
ELECTRICAL AND COMMUNICATION STRUCTURES

8-1. General

Electrical and communication system structures will be designed in accordance with TM 5-811-1/AFM 88-9, Chapter 1 and the following. In all cases, the Institute of Electrical and Electronics Engineers (IEEE) National Electric Safety Code (NESC) will be considered as establishing minimum requirements for design of structures associated with electric power systems. For aluminum towers and antennas, the one-third increase in allowable stresses under wind or seismic loads permitted in the Aluminum Association Specifications for Aluminum Structures will not be used. Design of electrical support systems for seismic restraint is covered in TM 5-809-10/NAVFAC P-355/AFM 88-3, Chapter 13.

8-2. Transmission towers and poles

Power transmission towers and pole structures will be designed in accordance with the NESC (IEEE (22), and the following ASCE publications: Manual 52, applicable technical papers in its Structural Division Journal (including Design of Steel Transmission Pole Structures), and Guide for the Design and Use of Concrete Poles. In case of conflicting criteria, the most conservative method will be used.

8-3. Substation structures and equipment

Substation, switching station, and similar structures for supporting electrical equipment will be constructed, where possible, of manufacturer's standard unit components. All structures, however, must be strong enough to resist the climatic design load requirements for the site. Where special structure design is needed, design criteria will conform to the National Electrical Manufacturers Association (NEMA) SG-6. General layouts and configurations for electrical support structures are given in TM 5-811-1/AFM 88-9, Chapter 1. Equipment foundations will be designed in accordance with current practices; the safety factor for stability against overturning and for resistance against sliding will be as set forth in paragraph 1-6.

8-4. Antenna towers

Antenna towers will be designed using applicable criteria from the Electronic Industries Association (EIA) 222-D. Design methods and stresses will be as appropriate for the material used for the supporting structure.

8-5. Underground structures

Underground structures associated with electrical and communication systems, e.g., manholes, handholes, pull boxes, etc., will be designed according to the criteria for manholes and inlets in paragraph 4-1. The need for water resistance and provisions for drainage and sumps will be examined, as well as cable bending radii and details of required support systems, when establishing the layout and dimensions of such structures. Design will also comply with ASTM C 857 and C 858.